Perceptual and Motor Skills, 1985, 60, 59-65. © Perceptual and Motor Skills 1985

GEOPHYSICAL VARIABLES AND BEHAVIOR: XXII. THE TECTONOGENIC STRAIN CONTINUUM OF UNUSUAL EVENTS

M. A. PERSINGER[1]

Laurentian University

Summary.—Transient and very localized geophysical forces are hypothesized to be a major source of phenomena that have been traditionally labelled as haunts and poltergeists. They would be generated by increasing tectonic stresses and would display electromagnetic and gravitational characteristics. Materials would be influenced according to their physical properties. Dielectric materials would respond differently from conductors. Organic semiconductors, of which the human being is an important subcategory, would be affected as well. The conspicuous overlaps between (non-convulsive) complex partial epilepsy and many episodes of poltergeists and haunts are expected in light of the direct stimulation of the observer's brain by the transient, intense magnetic fields and the lability of temporal lobe structures. Implications and some general predictions for the distribution of these phenomena in time and space are discussed.

Reports of haunts, poltergeists, odd luminous displays, and "unreal things" are still persistent in contemporary culture (Persinger & Lafreniere, 1977). Their frequency of occurrence may range from about once a year to several times per day. The more frequent cases usually disrupt day-to-day human activity and are more likely to be covered by local news media. Traditionally, these reports have been indiscriminately labelled as paranormal or as psychiatric phenomena. From another approach, these phenomena could be considered the subject matter of behavioral epidemiology. Many reports of haunts and poltergeists would be actual experiences that are generated by environmental stimuli.

The primary hypothesis is that many of these unusual events are generated by transient geophysical fields (TGF) that involve both electromagnetic-like and gravity-related components. These fields, without accompanying vibration, would be generated by changing tectonic stresses within the earth's crust. They would exist as brief, very localized manifestations of this strain. Very small TGFs ($\leq$ 0.01 m^2) may last on the order of seconds while larger ones (1 m^2) may exist for decaseconds. Sudden changes in other geophysical forces, particularly sudden enhancements of geomagnetic activity could directly interact with (or contribute to) the strain condition and precipitate specific episodes of these phenomena.

Two conceptual features of the hypothesis may help explain the unusual nature of these phenomena. First, the brief localization of forces that are usually

[1]Address requests for reprints to Department of Psychology, Laurentian University, Sudbury, Ontario, Canada P3E 2C6.

distributed more or less consistently over proportionally larger areas would produce the exceptional dynamics. This effect is similar to that of a tornado. Whereas a packet of energy that is distributed gradually over a large area may produce only a mild breeze, the same amount of energy focused within a smaller space for a very brief time can evoke a violent vortical phenomenon.

The second concept relates to the perceptual organization of phenomena. Anomalous and extraordinary properties are expected to be found within any phenomenon when very, very small spatial subsets of it are sampled. For example, a glass of water containing lipids may appear homogeneous. However, very, very small samples of the contents may contain properties (liquid crystal phases) that are not reflected at the perspective of the whole set. In the present hypothesis, the TGFs are analogous microcomponents from large geophysical forces. Although TGFs are miniscule in comparison to the areas and energies from which they are generated, they fall within the range of human perception.

Relatively weak TGFs may be associated with traditional reports of poltergeists and haunts while more energetic manifestations would generate luminous displays. They would be biologically hazardous within a human habitat. Whereas weaker TGFs would be associated with tens to hundreds of multiple events (each lasting a few seconds) with intermittent intervals of several minutes to hours within an episode of a few months, the stronger TGFs may occur only once within the same space. They would be more evident over a larger area (100 km^2) and within larger time frames (Persinger, 1984).

Although the physical mechanisms by which TGFs are localized remain to be specified, they are considered surface correlates of strain pulses from within the earth's crust. These pulses may incorporate the energies associated with sudden storm commencements and other abrupt increases in geomagnetic activity. The occurrence of TGFs may be more persistent than suspected. Those dominated by electromagnetic features would be associated with brief electrical failures, current surges and alterations in radio transmission or reception. Since these common events are usually attributed to more mundane explanations, TGFs would remain hidden events until a systematic social network is established to detect them.

Events that would be compatible with the characteristics of TGFs have been popularly associated with haunts and poltergeists (Sudre, 1960). Actual records are less frequent. Bender (1969) noted a strong disruption of his pen recorders during a classic poltergeist case that included multiple electrical surges and disruptions of electronic equipment. More recently, Persinger and Cameron (1984) noted two distinct and powerful electromagnetic-like events during a "weak" poltergeist/haunt episode. The duration of the events was about 10 seconds each and corresponded roughly to the duration of the paranormal experiences.

So-called haunt episodes are dominated by experiences of intense fear, odd feelings and the perception of unreal forms. They range from shadowy apparitions to dark animals that are described as part dog and part bear. Objectively, the symptomology is extraordinarily similar to intractable psychomotor epilepsy or complex (non-convulsive) partial epilepsy (Ervin, 1975). Poltergeist episodes involve the movements of objects, electrical oddities, and physiological alterations (welts, lacerations). Although both types of events share features with reports following a single, close proximity to luminous displays (Persinger, 1983), there are important differences. Luminous displays are frequently associated with "body burns," paralyses, unconsciousness, and many of the physiological symptoms of intense microwave exposure. Haunt and poltergeist reports are subject to greater variability. This is expected since the observers would be exposed within their houses to different intensities and numbers of TGFs.

The effects of TGFs upon inanimate and animate objects within the proximity should be predictable, in general, by contemporary principles of physics. Their application is facilitated by translating the objects and architecture into electromagnetic equivalents. Some TGFs would be expected to achieve intensities that could induce current in conductors, producing recurrent telephone rings, light-bulb failures, or malfunction of household appliances. Whereas heat would be generated by intense TGFs within conductors, nearby dielectrics would be displaced; the motion of the objects, including spin, would reflect the vector of the TGFs. Dielectric materials such as glass, crockery, and plastics are notorious "targets" of poltergeist displays (Roll & Pratt, 1971). Considering the source of TGFs, the contribution of gravitational components to the kinetics of the objects cannot be ignored. Although large scale correlations between gravity and magnetic anomalies have been documented (Hide & Malin, 1970), the characteristics of brief, localized alterations in gravity are unknown.

If each event displayed more or less the same force, then a smaller mass (glass figurine) would be displaced further than a larger mass (table). There should be a clear distance-dependence between the intensity of the effect and the locus of the TGF source. In addition, these physical events should be systematically related to major geometries of house conductors, such as plumbing fixtures and wiring. All three of these patterns have been determined in spontaneous cases (Roll, 1968, 1974). The general direction of movement should be similar for most objects from an entire episode. The direction should reflect the local stress vector. Although persistent patterns in movement have been noted (Roll, 1968), there has been no attempt to correlate them with local stress parameters.

As the strain factor escalates, the intensity, frequency of presentation, and the area of TGFs should increase. More robust TGFs allow more complicated

and bizarre effects (considering their interaction with the complex geometry of house furnishings). The effects may even spread outside previous perimeters to include adjacent human habitats. As the intensity increases, the risk of luminosities, and hence multiple fires, increases. Very intense luminous displays could carbonize living systems and may contribute to reports of so-called spontaneous human combustion. No doubt these events are more numerous out-of-doors; they are just more obvious within life spaces.

Since the human body is an organic semiconductor and TGFs could occur within living areas, current induction within biological tissue must occur. Brain and heart are the two most susceptible organs. The most electrically unstable portion of the brain, the temporal lobe, would be preferentially affected. Experiences would be similar to those generated by direct surgical stimulation of deep temporal lobe structures (Horowitz & Adams, 1970). TGFs that induce electrical currents with very high spatial gradients within the brain (that simulate epileptic foci or neurosurgical stimulation) would be most effective. The resulting experience would be attributed to extrinsic sources and determined as quite real (Mahl, Rothenberg, Delgado, & Hamlin, 1964). Comparable firing thresholds and correlative experiences in the normal population, including field investigators, are expected.

Reports of strong smells, loud noises (footsteps in a hollow chamber), human voices, odd visceral sensations, depersonalization, dreamy scenes, and vivid, visual sequences are common to both surgical stimulation (Mark, Ervin, & Sweet, 1972) and haunt/poltergeist episodes. Depending upon the focus and intensity of current induced within the brain by TGFs, the experiences would change from interesting or even pleasurable encounters to frank fear or terror. Morbid death themes, such as skeletons, coffins, etc., are typical features of more profound temporal lobe disorders (McHarg, 1973). Experiences of humanoids, apparitional forms, and unreal creatures, often "seen" in the peripheral vision and for less than a second (Owen, 1964), are common features of many haunt and some poltergeist displays. They are also surprisingly frequent during temporal lobe ictal phases (Crosby, Humphrey, & Lauer, 1962; Baldwin, 1970) and were even conspicuous before the introduction of medication (Spratling, 1904). Obviously the context in which they occur will influence the content and interpretation. More mundane schizophrenic factors complicate this problem but can be distinguished by the absence of physical events and specific themes.

Occurrence of TGFs near or within the body could evoke less bizarre symptoms, such as tingling or prickly sensations, piloerection, and enhanced phosphene occurrence. These experiences would be more evident at night or during decreased visual input (in the dark). Because the relationship between the temporal lobe and dream process is intimate, sleep disorders and odd or unusual dreams are expected. A particularly unpleasant possibility

with intense TGFs is the protracted interference with cardiac or respiratory activity that would be accompanied by sensations of suffocation. Application of only 30 mA across the brain stem can be lethal (Breggin, 1979, pp. 16-35). Depending upon the local geochemistry, the release of gases, such as sulfides, could confound these observations.

The similarity between poltergeist/haunt episodes and the continuum of complex partial (non-convulsive) epilepsy is striking and has been noted by others (Leon, 1975; Roll, 1978). From the context of psychological stability and general health, the similarity evokes critical questions. Are these temporal lobe profiles consequences of repeated exposure to TGFs or are people who display temporal lobe lability more sensitive to TGFs? Poltergeist episodes are frequently associated with pubescent children or adults during personal crises. Both conditions are notorious for either labile temporal-lobe electroencephalographic profiles or for physiological changes that encourage them. No doubt these symptoms and paranormal themes could occur without the presence of TGFs (Harper & Roth, 1962).

On the other hand, current densities sufficient to influence inanimate objects could certainly promote membrane fusion and ectopic tissue growth. Assuming tissue resistivity of 10 ohm-m and a sine-wave like rise time, a 10-Hz field of 1 Tesla (10 Kgauss), which is well within the estimated value for TGFs, could induce 1-mA currents within brain tissue. If a focus existed within a human habitat, then sensitive individuals would be exposed to repeated "whole body" stimulation. Haunt areas, which are prone to intermittent reports of odd phenomena, would be a prolonged source of stimulation. Recent experimental (Sloviter, 1983) and clinical (Engles, 1983) observations indicate that focal epileptiform hyperexcitation along limbic pathways can destroy certain neurons; behavioral changes could follow. Obviously, the cumulative effects of exposures to TGFs (especially for field investigators) are a special problem.

The simultaneous display of both physical events and experiences evoked by affecting the primary measurer (the brain) would produce a confusing, complex mixture of rational and bizarre events. They would be interspersed with normal responses to the trauma of the experiences as well as the consequences of direct TGF exposure. Emergence of automatisms and severe temporal lobe dysfunction may tend to color the source of the phenomena and evoke more convenient psychiatric labels. The emotional nature of the problem and the human condition would contribute to the preference for a quick, all-or-none solution to and escape from the dilemma (Persinger, 1976). Modifications of the investigating scientists' own belief systems and objectivity are sensitive issues for which methodological controls must still be developed.

If TGFs are responsible for a continuum of poltergeist, haunt and UFO-related events, then they should be correlated significantly over time in the

same space. At least one analysis (Persinger, 1982) has indicated this pattern. In addition, poltergeist and haunt reports should increase during periods of optimal tectonic strain and geomagnetic perturbation. On a large scale, they should occur in seismic-prone regions. Locally these events should cluster near areas of stress accumulation and stress release such as fault lines or the interfaces of varying geochemistry.

If strain variations in a region have been systematic over decades then these events may occur repeatedly in the same area. The area or the house may be associated with a long history of folklore and multiple, brief residencies. Whereas popular interpretations suggest a causal relationship between death (usually violent) in the area and haunt reports, the hypothesis would predict that both phenomena could be produced by very intense TGFs.

Several trigger variables may be expected to determine the day and the hour of the manifestations. These variables would either precipitate the optimal strain condition or directly contribute to the process. In the first instance, lunar tides or the quick passage of air masses could trigger the TGF. Geomagnetic storms, particularly those associated with sudden commencements would trigger the TGF by interacting with the tectonic strain factor. If this is correct, then the onset of many poltergeist episodes should occur on the day or days following the onset of intense, sudden magnetic storms.

The hypothesis also predicts the existence of a factor that relates human characteristics to the gravitational components of TGFs. Since poltergeist episodes are frequently associated with the presence of specific individuals, there should be some measurable alterations in body electrophysiology or physical chemistry (influenced by hormonal events), that affect the manifestations or the occurrence of TGFs. The general hypothesis certainly does not explain all of the patterns involved with this unusual continuum; however, it offers realistic options and cautions to the field behavioral scientist who is interested in pursuing these challenging phenomena.

REFERENCES

BALDWIN, M. Neurological syndromes and hallucinations. In W. Keup (Ed.), *Origin and mechanisms of hallucinations*. New York: Plenum, 1970. Pp. 3-12.

BENDER, H. New developments in poltergeist research. *Proceedings of the Parapsychological Association*, 1969, 6, 81-102.

BREGGIN, P. R. *Electroshock—its brain disabling effects*. New York: Springer Publ., 1970.

CROSBY, C. C., HUMPHREY, T., & LAUER, E. *Correlative anatomy of the nervous system*. New York: Macmillan, 1962.

ENGLES, J. Epileptic brain damage: how much excitement can a limbic neuron take? *Trends in the Neurosciences*, 1983, 6, 356-357.

ERVIN, F. R. Organic brain syndromes associated with epilepsy. In A. M. Freedman, H. I. Kaplan, & B. J. Sadock (Eds.), *Comprehensive textbook of psychiatry*. Baltimore: Williams & Wilkins, 1975. Pp. 1138-1157.

HARPER, M., & ROTH, M. Temporal lobe epilepsy and the phobic anxiety-depersonalization syndrome: Part I. A comparative study. *Comprehensive Psychiatry*, 1962, 3, 129-151.

HIDE, R., & MALIN, S. R. C. Novel correlations between global features of the earth's gravitational and magnetic fields. *Nature*, 1970, 225, 605-609.

HOROWITZ, M. J., & ADAMS, J. E. Hallucinations on brain stimulation: evidence for revision of the Penfield hypothesis. In W. Keup (Ed.), *Origin and mechanisms of hallucinations*. New York: Plenum, 1970. Pp. 13-20.

LEON, C. A. "El Duende" and other incubi. *Archives of General Psychiatry*, 1975, 32, 155-162.

MAHL, G. F., ROTHENBERG, A., DELGADO, J. M. R., & HAMLIN, H. Psychological responses in the human to intracerebral electrical stimulation. *Psychosomatic Medicine*, 1964, 26, 337-368.

MARK, V. H., ERVIN, F. R., & SWEET, W. H. Deep temporal lobe stimulation in man. In B. E. Elftheriou (Ed.), *The neurobiology of the amygdala*. New York: Plenum, 1972. Pp. 485-507.

MCHARG, J. F. Poltergeist and apparitional haunting phenomena affecting the family and associates of an adolescent girl with well-controlled epilepsy. In W. G. Roll, R. L., Morris, & J. D. Morris (Eds.), *Research in parapsychology*. Metuchen, NJ: Scarecrow Press, 1973. Pp. 17-19.

OWEN, A. R. G. *Can we explain the poltergeist?* New York: Helix Press, Garrett Publ., 1964.

PERSINGER, M. A. The problems of human verbal behavior: the final reference for measuring ostensible psi phenomena. *Journal of Research in PSI Phenomena*, 1976, 1, 72-90.

PERSINGER, M. A. Geophysical variables and behavior: IV. UFO reports and fortean phenomena: temporal correlations in the central U.S.A. *Perceptual and Motor Skills*, 1982, 54, 299-302.

PERSINGER, M. A. Geophysical variables and behavior: IX. Expected clinical consequences of close proximity to UFO-related luminosities. *Perceptual and Motor Skills*, 1983, 56, 259-265.

PERSINGER, M. A. Geophysical variables and human behavior: XVIII. Expected perceptual characteristics and local distributions of close UFO reports. *Perceptual and Motor Skills*, 1984, 58, 951-959.

PERSINGER, M. A., & CAMERON, R. Possible tectonogenic electromagnetic transients during a low-level poltergeist/haunt episode. *Journal of the American Society for Psychical Research*, in press.

PERSINGER, M. A., & LAFRENIERE, G. F. *Space-time transients and unusual events*. Chicago, IL: Nelson-Hall, 1977.

ROLL, W. G. Some physical and psychological aspects of a series of poltergeist phenomena. *Journal of the American Society for Psychical Research*, 1968, 62, 263-306.

ROLL, W. G. *The poltergeist*. New York: Signet, 1974.

ROLL, W. G. Poltergeists. In B. B. Wolman (Ed.), *Handbook of parapsychology*. New York: Van Nostrand Reinhold, 1978. Pp. 382-413. (a)

ROLL, W. G. Understanding the poltergeist. In W. G. Roll (Ed.), *Research in parapsychology 1977*. Metuchen, NJ: Scarecrow Press, 1978. Pp. 183-195. (b)

ROLL, W. G., & PRATT, J. G. The Miami disturbances. *Journal of the American Society for Psychical Research*, 1971, 65, 409-454.

SLOVITER, R. S. "Epileptic" brain damage in rats induced by sustained electrical stimulation of the perforant path: I. Acute electrophysiological and light microscopic studies. *Brain Research Bulletin*, 1983, 10, 675-697.

SPRATLING, W. P. *Epilepsy and its treatment*. New York: Saunders, 1904.

SUDRE, R. *Parapsychology*. New York: Grove, 1960.

Accepted November 7, 1984.